CLAIMS

1. A method for determining a compact model to transcribe a language acoustically based on well-defined basic phonetics, said method comprising:

extracting phonetic information regarding said language;

defining, based on said extracted information, phonological and phonetic units associated with said language;

identifying variations in said language;

developing a maximal set based on said defined phonological units, phonetic units, and identified variations in said language, and

reducing said maximal set to a minimal set of phonemes and allophones, thereby providing for a compact model for acoustically transcribing said language.

2. A method for determining a compact model to transcribe a language acoustically based on well-defined basic phonetics, as per claim 1, wherein said step of extracting information further comprises:

identifying terminological problems associated with said language;

identifying transcription problems associated with said language;

extracting all phonological and phonetic units associated with said language, and

selecting a representative symbol for the transcription alphabet.

3. A method for determining a compact model to transcribe a language acoustically based on well-defined basic phonetics, as per claim 1, wherein said maximal set comprises any of, or a combination of: phonemes, allophones, rules governing the selection of allophones, a set of examples, and transliteration symbols.

4. A method for determining a compact model to transcribe a language acoustically based on well-defined basic phonetics, as per claim 1, wherein said step of reducing said maximal set further comprises reducing an automatic speech recognition phonetic set.

5. A method for determining a compact model to transcribe a language acoustically based on well-defined basic phonetics, as per claim 4, wherein said step of reducing an automatic speech recognition phonetic set further comprises the use of diacritics, graphemes, and allophones.

6. A method for determining a compact model to transcribe a language acoustically based on well-defined basic phonetics, as per claim 1, wherein said step of reducing said maximal set further comprises reducing a text-to-speech phonetics set.

7. A method for determining a compact model to transcribe a language acoustically based on well-defined basic phonetics, as per claim 6, wherein said step of reducing an text-to-speech phonetics set is accomplished by using allophones and adding symbols representing the phoneme to be geminated.

8 A method for determining a compact model to transcribe a language acoustically based on well-defined basic phonetics, as per claim 1, wherein said transcription alphabet is in compliance with the International Phonetics Alphabet (IPA).

9. A method for determining a compact model to transcribe a language acoustically based on well-defined basic phonetics, as per claim 1, wherein said language is any of the following: modern standard Arabic (MSA), classical Arabic, or colloquial Arabic.

10. A method for determining a compact model to transcribe a language acoustically based on well-defined basic phonetics, as per claim 1, wherein said phonetic information is extracted over a network.

11. A method for determining a compact model to transcribe a language acoustically based on well-defined basic phonetics, as per claim 2, wherein said network is any of the following networks: local area networks (LAN), wide area networks (WAN), Internet, HTTP-based networks, or wireless networks.

12. A voice control system utilizing a compact model to transcribe a language acoustically based on well-defined basic phonetics, said system comprising:

a computer system;

a microphone, said microphone interfacing with said computer system, said microphone capable of receiving voice input in said language,

a multimedia kit including full duplex sound card, said multimedia kit interfacing with said computer system, and said multimedia kit receiving said voice inputs from said microphone, and

said computer system receiving said voice input from said multimedia kit and phonetically analyzing said voice inputs using a stored compact set of phonetic alphabets thereby enabling translation of voice-to-text based on said stored compact set of phonetic alphabets.

13. A voice control system utilizing a compact model to transcribe a language acoustically based on well-defined basic phonetics, as per claim 12, wherein said multimedia kit further comprises a built-in automatic speech recognition (ASR) utility.

14. A voice control system utilizing a compact model to transcribe a language acoustically based on well-defined basic phonetics, as per claim 12, wherein said

multimedia kit recognizes human voice and interprets it into corresponding actions without being speaker dependent.

15. A voice control system utilizing a compact model to transcribe a language acoustically based on well-defined basic phonetics, as per claim 14, wherein said speaker dependant includes gender or age.

16. A voice control system utilizing a compact model to transcribe a language acoustically based on well-defined basic phonetics, as per claim 12, wherein said compact set of phonetic alphabets is accomplished using diacritics, graphemes, and allophones.

17. A voice control system utilizing a compact model to transcribe a language acoustically based on well-defined basic phonetics, as per claim 12, wherein said compact set of phonetic alphabets are compliant with the International Phonetics Alphabet (IPA) standard.

18. A voice control system utilizing a compact model to transcribe a language acoustically based on well-defined basic phonetics, as per claim 12, wherein said language is any of the following: modern standard Arabic, classical Arabic, or colloquial Arabic.

19. A voice control method utilizing a compact model to transcribe a language acoustically based on well-defined basic phonetics, said method comprising:

receiving voice inputs in said language via a microphone;

phonetically analyzing said received voice inputs using a computer-based system, and

said computer-based system analyzing said voice input using a stored compact set of phonetic alphabets, thereby enabling translation of voice-to-text based on said stored compact set of phonetic alphabets.

20. A voice control method utilizing a compact model to transcribe a language acoustically based on well-defined basic phonetics, as per claim 19, wherein said compact set of phonetic alphabets is accomplished using diacritics, graphemes, and allophones.

TABLE 1 ***Arabic Phonetic Alphabet Table***

The Table Supports:

1) Well Educated Pronunciation (Used in Text To Speech)

2) In the Sound Features Field
   a. (+) = Voiced
   b. (-) = Voiceless

L.Name	A. letter	Sound Features	New Alphabet	Examples	Transcription
Alif	**Ã**	glottal plosive -	C	**ÃóÏöáøóÉ**	Ce.dII.le
		epiglottal fricative +	0	**ãõÄóÐøöä**	mu.0e4.4In
Ba	**È**	bilabial plosive +	b	**ÈóÇØöáóÉ**	b1.8I.le
	Èø	geminated bilabial plosive +	B	**ÊóäóÈøóÃ**	te.ne.Be.0e
Ta	**Ê**	alveolar plosive -	t	**ÊóÍúáöíá**	teh.l3l
	Êø	geminated alveolar plosive	T	**ÓöÊøóÉ**	sI.Te
Tha	**Ë**	dental fricative -	F	**ËóãóÇäöíóÉ**	Fe.mE.ni.je
	Ëø	gemi[1]nated dental fricative -	FF	**ãõßóËøóÝ**	mu.keF.Fef
Jim	**Ì**	velar plosive +	g	**ÌóáûÓóÉ**	gel.se
		alveolo-palatal fricative +	5		5el.se
	Ìø	Geminated velar plosive +	G	**ãõÊóÚóÌøöá**	mu.te.Ve.GII
			55		mu.te.Ve5.5II
Ha	**Í**	Pharyngeal fricative -	h	**ÍóÖóÑó**	ha.6A.rA
	Íø	Geminated pharyngeal fricative -	hh	**ÕöÍøóÉ**	SIh.ha
Kha	**Î**	uvular fricative -	x	**ÎóãúÓóÉ**	xem.se
	Îø	geminated uvular fricative -	xx	**ÇáÓøóÎøóÇä**	Ces.sex.xEn
Dal	**Ï**	alveolar plosive +	d	**ÏóÚúã**	DeVm
	Ïø	geminated alveolar plosive +	D	**ãóÏøó**	me.De
Dal	**Ð**	dental fricative +	4	**ÂÐóÇä**	CE.4En

	Ðø	geminated dental fricative +	44	**ÇáÐøóÇÊöíø**	Ce4.4E.tlJ
Ra	**Ñ**	r flap not retroflexed +	r	**ÑóãúÓöíÓ**	ram.s3s
	Ñø	alveolar trill +	R	**ÃóÞóÑøó**	Ce.qA.RA
Za	**Ò**	alveolar fricative +	z	**ÒóíúÊ**	Zejt
	Òø	geminated alveolar fricative +	zz	**ÎóÒøóäó**	xez.ze.na
Sin	**Ó**	alveolar fricative -	s	**ÓóÈöíá**	se.b3l
	Óø	geminated alveolar fricative -	ss	**ÇóáÓøóÈúÊ**	Ces.sebt
Shin	**Ô**	post alveolar fricative -	c	**ÔóÑößóÉ**	ce.ri.ke
	Ôø	geminated post alveolar fricative -	cc	**ÇáÔøóæøóÇÝ**	Cec.ce.WEf
Sad	**Õ**	pharyngealised s -	S	**Õóáøöì**	SAl.l3
	Õø	geminated pharyngealised s -	SS	**ÇáÕøóíøóÇÏ**	CAS.SA.J1d
Dad	**Ö**	pharyngealised d +	6	**ÍóÖóÑó**	hA.6A.rA
	Öø	geminated pharyngealised d +	7	**ÝöÖøóÉ**	fl.7A
Ta	**Ø**	pharyngealised t -	8	**ØóáóÚó**	8A.la.Ve
	Øø	geminated pharyngealised t -	9	**ÇáÈóØøóÇÑöíøóÉ**	Cel.bA.92.rl.Je
Za	**Ù**	pharyngealised **dal** +	Z	**Ùóáøó**	ZAl.la
	Ùø	geminated pharyngealised **dal** +	ZZ	**ÇáÙøóáóÇã**	CAZ.ZA.l1m
Ain	**Ú**	pharyngeal fricative +	V	**ÚóÑúÖ**	VAr6

	Úø	geminated pharyngeal fricative +	VV	**ÃóÔöÚøóÉ**	Ce.clV.Ve
Ghain	**Û**	uvular fricative +	P	**ÇáÕøöÈóÇÛóÉ**	CeS.Si.b1.Pa
	Ûø	geminated uvular fricative +	PP	**ÊóæóÛøõá**	te.weP.Pol
Fa	**Ý**	labiodental fricative -	f	**ÇáúÍóÝúá**	Cel.hefl
		labiodental fricative +	v	**ÊáöíÝöÒíõæä**	tl.li.vls.jOn
	Ýø	geminated labiodental fricative -	ff	**ÇöÓúÊóÎóÝøó**	Cls.te.xef.fe
qaf	**Þ**	uvular plosive -	q	**ÞóÕúÑ**	QASr
	Þø	geminated uvular plosive -	Q	**ÍóÞøóåõ**	ha.QA.Hu
kaf	**ß**	velar plosive -	k	**ßõáøöíøóÉ**	kul.li.Je
	ßø	geminated velar plosive -	K	**ÊóäóßøóäóÊ**	te.me.Ke.net
lam	**á**	alveolar lateral approximant +	l	**íõáóÈøöí**	ju.le.B3
	áø	geminated alveolar lateral approximant +	LL	**Çááå**	CAL.L2X
		geminated pharyngealised l +	ll	**ÇóáúãõÓóáøóÍóÉ**	Cel.mu.sel.le.ha
mim	**ã**	bilabial nasal +	m	**ãóÓúÌöÏ**	mes.5ld
	ãø	geminated bilabial nasal +	mm	**ÇáåóÇãøóÉ**	Cel.Hem.me
nun	**ä**	alveolar nasal +	n	**äóÙóã**	ne.Vem
		velar nasal +	N	**ÇóäúßóÑó**	CaN.ka.ra
	äø	geminated alveolar nasal +	nn	**ÊóÕóäøóÚó**	ta.San.na.Va
ha	**å**	glottal fricative -	X	**ÝóåúÏ**	feXd
		glottal fricative +	H	**ÙóåóÑó**	ZA.Ha.rA
	åø	geminated glottal fricative +	HH	**Êóæóåøóãó**	ta.weH.He.me

waw	**æ**	labio-velar approximant +	W	**Ïõæóá**	du.wel
	æø	geminated labio-velar approximant +	W	**ÇáÊøóáóæøõË**	Ce.Te.le.WuF
ya	**ì**	palatal approximant +	j	**íóÏúÚõã**	jed.Vom
	ìø	geminated palatal approximant +	J	**ÇáÊóÏóíøõä**	Ce.Te.de.Jon
fatha	open mid-front		e	ÊóÌúÑöÈóÉ	te5.rl.be
	open front		a	**ÕóÏóÞó**	SA.da.qa
	low back		A	**ÞóÖóì**	qA.62
kasra	mid-high mid-front short		i	ÇáäøóÇÞöÏ	Cen.n1.qld
	close front		I	**Åöáóì**	Ci.lE
damma	close back		u	**ÃõãøóåóÇÊ**	Cum.me.HEt
	open – mid back		o	**ÇáÛõÑóÝ**	Cel.Po.raf
alif	mid front long		E	**ÇáÔøóÈóÇÈ**	Cec.ce.bEb
	open front		1	**ÇáúÍóÇÓöÈ**	Cel.hE.slb
	low back		2	**ÇöäúÝöÕóÇá**	CIn.fi.S2l
waw	close back		U	**ÊóÏõæÑ**	te.dUr
	open mid back		O	**ÏõßúÊõæÑ**	duk.tOr
ya	mid-high mid-front long		Y	**ÃóãúÈöíÑ**	Cem.bYr
	close front		3	**ÑóÆöíÓ**	ra.03s

TABLE 2

wegd	æóÌúÏ
waqt	æóÞúÊ
WA6V	æóÖúÚ

(Different symbols that represent short Fatha)

NE.0Im	äÇÆã
N1.qId	äÇÞÏ
N2.6Ig	äÇÖÌ

(Different symbols that represent long Fatha)

TABLE 3

Ben.nEC	ÈóäøóÇÁú
Ra.B3	ÑóÈøöí
8A.lab	ØáÈ
CA.9A.lab	ÇáØøóáÈ

(Different symbols that represent gemination)

TABLE 4 **Phonetic Alphabet for Arabic Speech Recognition System**

English Representation	Arabic Letter	SAKHR Phonetic Symbol	Arabic Example
Plosives			
Hamza	Á	F	ÃÓÏ
Ba	È	b	ÈíÊ
Dal	Ï	d	Ïáíá
Dad	Ö	d%K	ÖãíÑ
Jim	Ì	g	ÌÈá
Kaf	ß	k	ßåÝ
Qaf	Þ	q	ÞÈá
Ta	Ê	t	ÊãÑ
Ta	Ø	t%K	ØÑíÞ
Nazals			
Mim	ã	m	ãäÒá
Nun	ä	n	äÌã
Trills			
Ra	Ñ	r	Ñåä
Fricatives			
Dal	Ð	D	ÐäÈ
Za	Ù	D%K	Ùá
Ain	Ú	F7	Úíä
Ghain	Û	R7	Ûíã
Shin	Ô	S	ÔãÓ
Tha	Ë	T	ËÞÈ
Kha	Î	X	ÎÑÌ
Fa	Ý	f	ÝÑ
Ha	åÜ	h	åÌÑ
Ha	Í	h>	ÍÑÈ
Sin	Ó	s	ÓãÇÁ
Sad	Õ	s%K	ÕíÏ
Za	Ò	z	Òíä
Approximants			
Ya	í	j	íæã
Lam	á	l	áæã

Waw	æ	w	æáÏ
Long Vowels			
Alif	Ç	a:	ÌÈÇá
Ya	í	i:	Ìíá
Waw	æ	u:	ÈæÑ
Short Vowels			
Fatha	ó	a	Íãá
Kasra	ö	i	ãÑäÉ
Damma	õ	u	ÞóÑÈ

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